

## 2008-2009 Influenza Season Week 21 ending May 30, 2009

*All data are preliminary and may change as more reports are received.*

*(Due to the response to the novel influenza A (H1N1) investigation, surveillance regions were changed from Census Divisions to Department of Health and Human Services (HHS) Regions.)*

**Synopsis:** During week 21 (May 24 - 30, 2009), influenza activity decreased in the United States, however, there are still higher levels of influenza-like illness than is normal for this time of year.

- Two thousand seventy-four (31.1%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza.
- The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold.
- Five influenza-associated pediatric deaths were reported.
- The proportion of outpatient visits for influenza-like illness (ILI) was below the national baseline. Three of the 10 surveillance regions reported ILI at or above their region-specific baseline.
- Five states reported geographically widespread influenza activity, 10 states reported regional influenza activity, the District of Columbia and 14 states reported local influenza activity, and 21 states reported sporadic influenza activity.

### National and Regional Summary of Select Surveillance Components

HHS Surveillance Regions*	Data for current week			Data cumulative for the season						
	Out-patient ILI†	% positive for flu‡	Number of jurisdictions reporting regional or widespread activity§	A (H1)	A (H3)	Novel A H1N1	A (could not be sub-typed)¶	A (Un-sub-typed)	B	Pediatric Deaths
<b>Nation</b>	Normal	31.1%	15 of 51	7,565	1,992	6,247	691	12,536	10,231	67
<b>Region I</b>	Elevated	25.7%	2 of 6	520	148	781	12	1,107	800	1
<b>Region II</b>	Elevated	23.8%	2 of 2	270	127	295	16	1,311	710	8
<b>Region III</b>	Normal	28.9%	3 of 6	1,223	196	461	265	624	1,351	9
<b>Region IV</b>	Normal	11.8%	2 of 8	808	98	169	33	1,754	1,190	6
<b>Region V</b>	Normal	32.8%	1 of 6	1,630	174	3,171	103	500	1,294	11
<b>Region VI</b>	Normal	10.2%	1 of 5	737	107	361	4	3,998	2,561	12
<b>Region VII</b>	Normal	12.4%	0 of 4	496	57	126	174	458	526	0
<b>Region VIII</b>	Normal	14.8%	1 of 6	469	208	373	53	1,444	491	6
<b>Region IX</b>	Normal	19.6%	3 of 4	1,045	600	356	13	1,007	649	13
<b>Region X</b>	Elevated	27.2%	0 of 4	367	277	154	18	333	659	1

\* HHS regions (Region I: CT, ME, MA, NH, RI, VT; Region II: NJ, NY, Puerto Rico, US Virgin Islands; Region III: DE, DC, MD, PA, VA, WV; Region IV: AL, FL, GA, KY, MS, NC, SC, TN; Region V: IL, IN, MI, MN, OH, WI; Region VI: AR, LA, NM, OK, TX; Region VII: IA, KS, MO, NE; Region VIII: CO, MT, ND, SD, UT, WY; Region IX: AZ, CA, Guam, HI, NV; and Region X: AK, ID, OR, WA)

† Elevated means the % of visits for ILI is at or above the national or region-specific baseline

‡ National data are for current week; regional data are for the most recent three weeks

§ Includes all 50 states and the District of Columbia

¶ The majority of influenza A viruses that cannot be sub-typed as seasonal influenza viruses are novel A (H1N1) influenza viruses upon further testing

**U.S. Virologic Surveillance:** WHO and NREVSS collaborating laboratories located in all 50 states and Washington D.C. report to CDC the number of respiratory specimens tested for influenza.

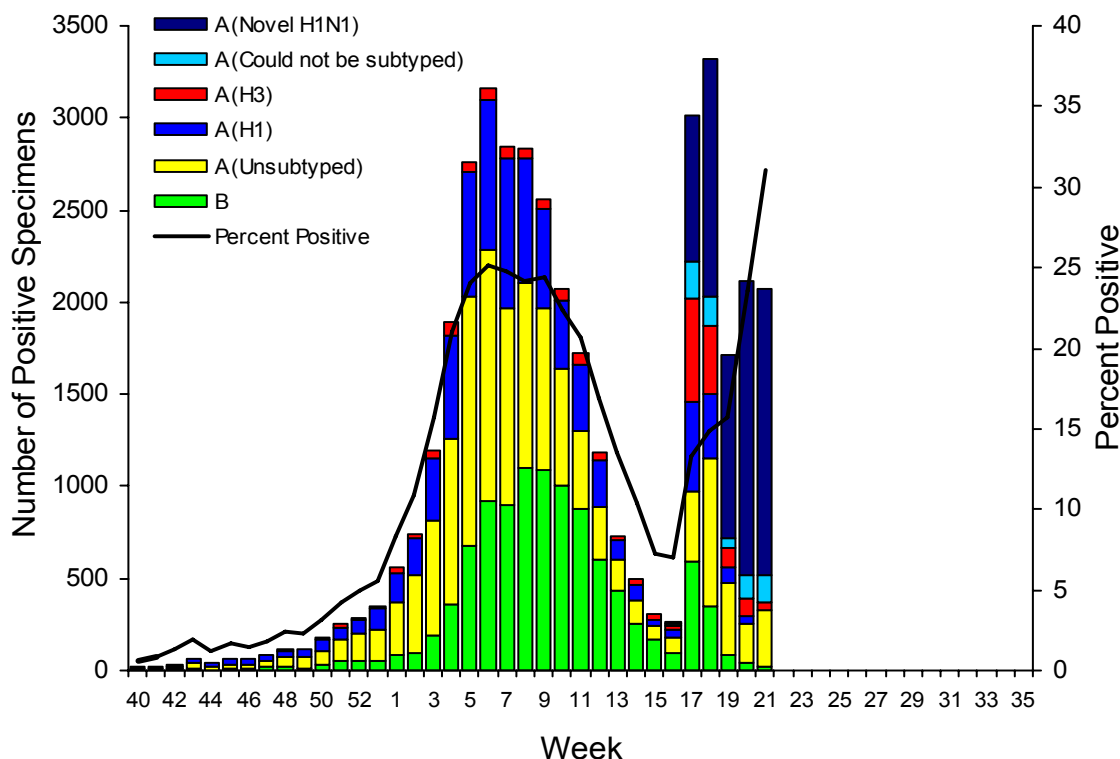
During the 2008-09 season, influenza A (H1), A (H3), and B viruses have co-circulated in the United States. On April 15 and 17, 2009, CDC confirmed that two cases of febrile respiratory illness occurring in children who reside in adjacent counties in southern California were caused by infection with a novel influenza A (H1N1) virus. As of June 5, 2009, 13,217 confirmed and probable infections with novel influenza A (H1N1) virus have been identified by CDC and state and local public health departments. Reporting of novel influenza A (H1N1) viruses by U.S. WHO collaborating laboratories began during week 17. The results of tests performed during the current week are summarized in the table below.

	<b>Week 21</b>
<b>No. of specimens tested</b>	6,679
<b>No. of positive specimens (%)</b>	2,074 (31.1%)
<b><i>Positive specimens by type/subtype</i></b>	
<b>Influenza A</b>	2,057 (99.2%)
<b>A (H1)</b>	4 (0.2%)
<b>A (H3)</b>	36 (1.8%)
<b>A (unsubtyped)</b>	311 (15.1%)
<b>A (could not be subtyped)</b>	148 (7.2%)
<b>A (novel influenza H1N1)</b>	1,558 (75.7%)
<b>Influenza B</b>	17 (0.8%)

During week 21, seasonal influenza A (H1), A (H3), and B viruses continue to co-circulate at low levels with novel influenza A (H1N1). Approximately 82% of all influenza viruses being reported to CDC this week are novel influenza A (H1N1) viruses.

The increase in the percentage of specimens testing positive for influenza by WHO and NREVSS collaborating laboratories may be due in part to changes in testing practices by health care providers, triaging of specimens by public health laboratories, an increase in the number of specimens collected from outbreaks, and other factors.

## Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2008-09



**Antigenic Characterization:** CDC has antigenically characterized 1,567 seasonal human influenza viruses [947 influenza A (H1), 162 influenza A (H3) and 458 influenza B viruses] collected by U.S. laboratories since October 1, 2008, and 84 novel influenza A (H1N1) viruses.

All 947 influenza seasonal A (H1) viruses are related to the influenza A (H1N1) component of the 2008-09 influenza vaccine (A/Brisbane/59/2007). All 162 influenza A (H3N2) viruses are related to the A (H3N2) vaccine component (A/Brisbane/10/2007).

All 84 novel influenza A (H1N1) viruses are related to the A/California/07/2009 (H1N1) reference virus selected by WHO as a potential candidate for novel influenza A (H1N1) vaccine.

Influenza B viruses currently circulating can be divided into two distinct lineages represented by the B/Yamagata/16/88 and B/Victoria/02/87 viruses. Sixty-one influenza B viruses tested belong to the B/Yamagata lineage and are related to the vaccine strain (B/Florida/04/2006). The remaining 397 viruses belong to the B/Victoria lineage and are not related to the vaccine strain.

Data on antigenic characterization should be interpreted with caution given that antigenic characterization data is based on hemagglutination inhibition (HI) testing using a panel of reference ferret antisera and results may not correlate with clinical protection against circulating viruses provided by influenza vaccination.

Annual influenza vaccination is expected to provide the best protection against those virus strains that are related to the vaccine strains, but limited to no protection may be expected when the vaccine and circulating virus strains are so different as to be from different lineages, as is seen with the two lineages of influenza B viruses. Antigenic characterization of novel influenza A (H1N1) viruses indicates that these viruses are antigenically and genetically unrelated to seasonal influenza A (H1N1) viruses, suggesting that little to no protection would be expected from vaccination with seasonal influenza vaccine.

**Antiviral Resistance:** Since October 1, 2008, 930 seasonal influenza A (H1N1), 172 influenza A (H3N2), and 491 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Nine hundred fifty-eight seasonal influenza A (H1N1) and 166 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). One hundred fifty-six novel influenza A (H1N1) viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). One hundred twenty-five novel influenza A (H1N1) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). The results of antiviral resistance testing performed on these viruses are summarized in the table below.

	Isolates tested (n)	Resistant Viruses, Number (%)		Isolates tested (n)	Resistant Viruses, Number (%)
		Oseltamivir	Zanamivir		Adamantanes
<b>Seasonal Influenza A (H1N1)</b>	930	925 (99.5%)	0 (0)	958	5 (0.5%)
<b>Influenza A (H3N2)</b>	172	0 (0)	0 (0)	166	166 (100%)
<b>Influenza B</b>	491	0 (0)	0 (0)	N/A*	N/A*
<b>Novel Influenza A (H1N1)</b>	156	0 (0)	0 (0)	125	125 (100%)

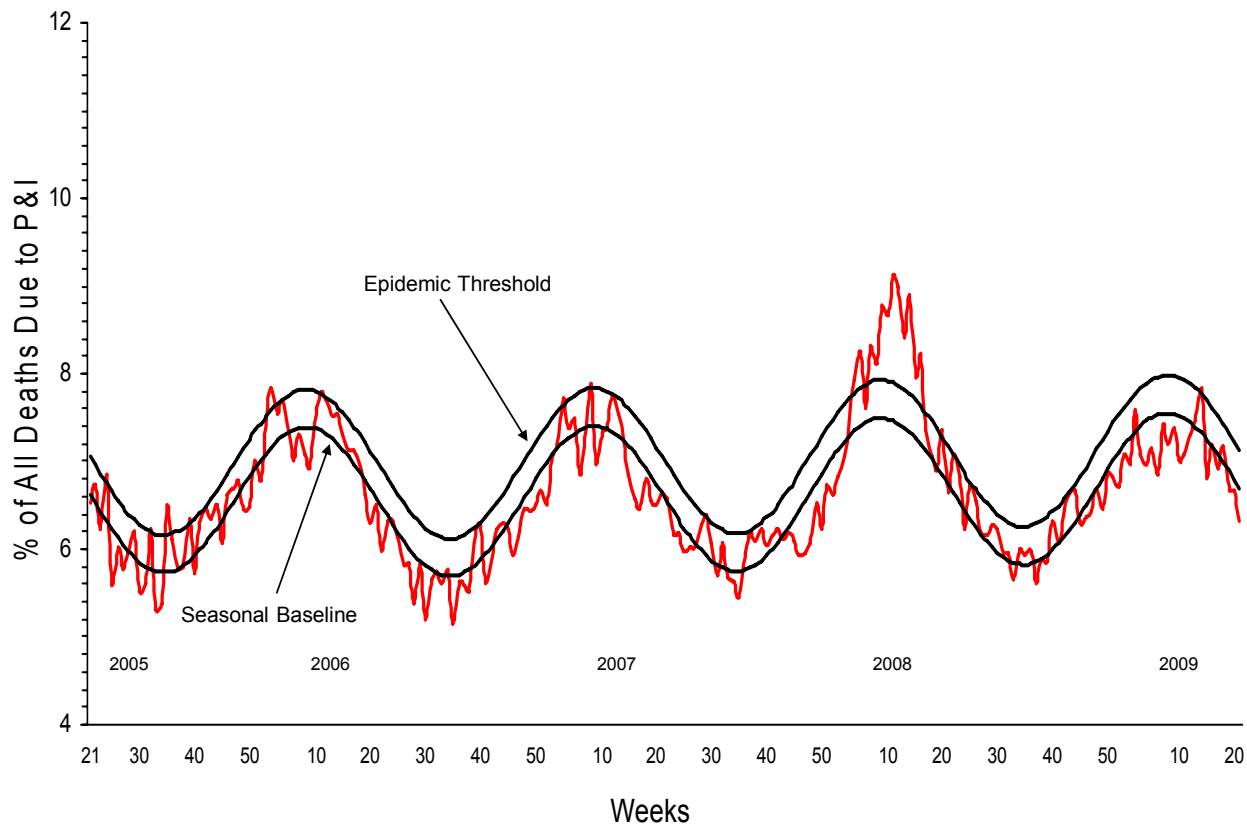
\*The adamantanes (amantadine and rimantadine) are not effective against influenza B viruses.

Antiviral treatment with either oseltamivir or zanamivir is recommended for all patients with confirmed, probable or suspected cases of novel influenza A (H1N1) virus infection who are hospitalized or who are at higher risk for seasonal influenza complications. The novel influenza A (H1N1) virus is susceptible to both neuraminidase inhibitor antiviral medications zanamivir and oseltamivir. It is resistant to the adamantane antiviral medications, amantadine and rimantadine. Additional information on antiviral recommendations for treatment and chemoprophylaxis of novel influenza A (H1N1) infection is available at <http://www.cdc.gov/h1n1flu/recommendations.htm>

In areas that continue to have seasonal influenza activity, especially those with circulation of oseltamivir-resistant seasonal human influenza A (H1N1) viruses, clinicians might prefer to use either zanamivir or a combination of oseltamivir and either rimantadine or amantadine to provide adequate empiric treatment or chemoprophylaxis for patients who might have seasonal human influenza A (H1N1) virus infection.

**Pneumonia and Influenza (P&I) Mortality Surveillance:** During week 21, 6.3% of all deaths reported through the 122-Cities Mortality Reporting System were due to P&I. This percentage is below to the epidemic threshold of 7.1% for week 21.

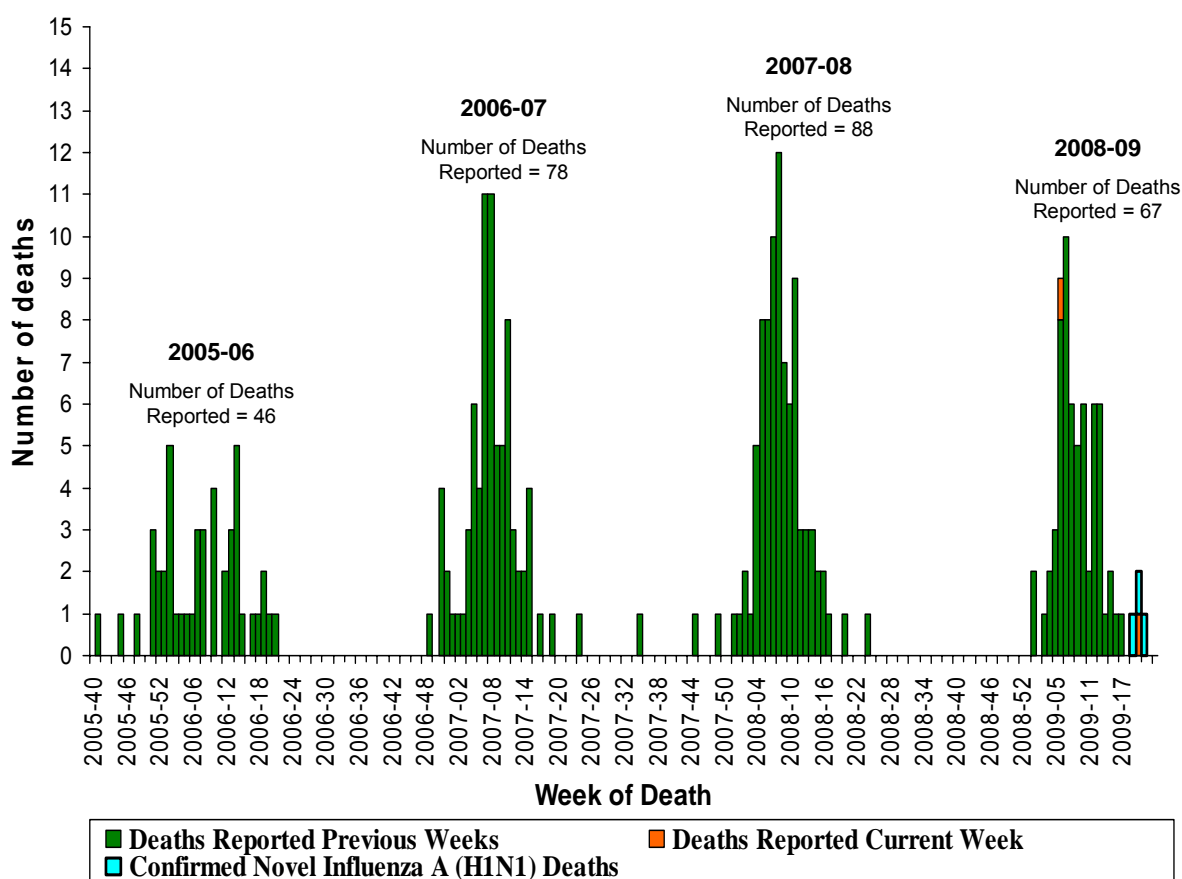
### Pneumonia and Influenza Mortality for 122 U.S. Cities Week ending 5/30/2009



**Influenza-Associated Pediatric Mortality:** Five influenza-associated pediatric deaths were reported to CDC during week 21 (Arizona [2], California, Colorado, and Illinois). Three of these deaths were associated with confirmed infections with novel influenza A (H1N1) viruses; one was confirmed as seasonal influenza A (H1N1), and one was confirmed as an influenza A virus (subtype unknown). The deaths reported this week occurred between February 8, 2009 and May 26, 2009. Since September 28, 2008, CDC has received 67 reports of influenza-associated pediatric deaths that occurred during the current influenza season.

Of the 33 children who had specimens collected for bacterial culture from normally sterile sites, 14 (42.4%) were positive; *Staphylococcus aureus* was identified in nine (64.3%) of the 14 children. One of the three children with confirmed novel influenza A (H1N1) infection had a specimen collected from a normally sterile site; bacterial cultures were negative. Four of the *S. aureus* isolates were sensitive to methicillin and five were methicillin resistant. Twelve (85.7%) of the 14 children with bacterial coinfections were five years of age or older and 10 (71.4%) of the 14 children were 12 years of age or older. An increase in the number of influenza-associated pediatric deaths with bacterial coinfections was first recognized during the 2006-07 influenza season. In January 2008, interim testing and reporting recommendations were released regarding influenza and bacterial coinfections in children and are available at (<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00268>).

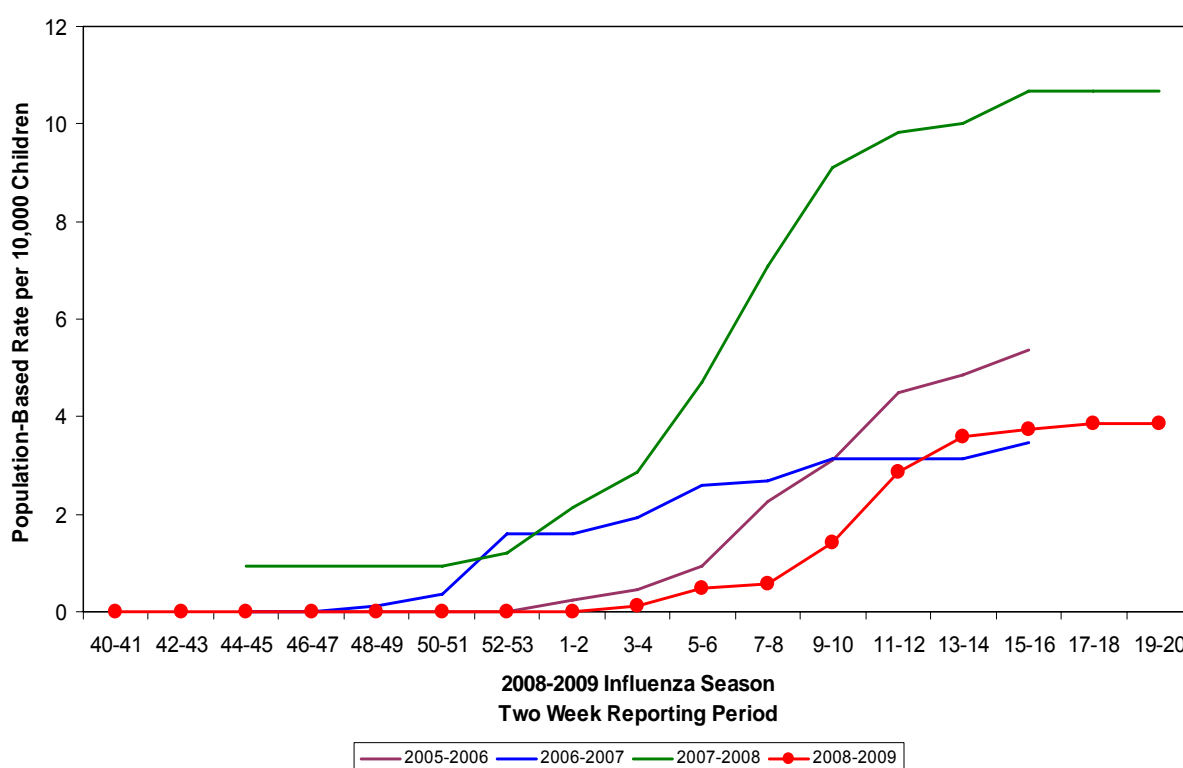
### Number of Influenza-Associated Pediatric Deaths by Week of Death: 2005-06 season to present



**Influenza-Associated Hospitalizations:** Laboratory-confirmed influenza-associated hospitalizations are monitored in two population-based surveillance networks: the New Vaccine Surveillance Network (NVSN) and the Emerging Infections Program (EIP).

During October 12, 2008 to May 16, 2009, the preliminary laboratory-confirmed influenza-associated hospitalization rate for children 0-4 years old in the NVSN was 3.85 per 10,000. Because of case identification methods utilized in this study, there is a delay from the date of hospitalization to the date of report.

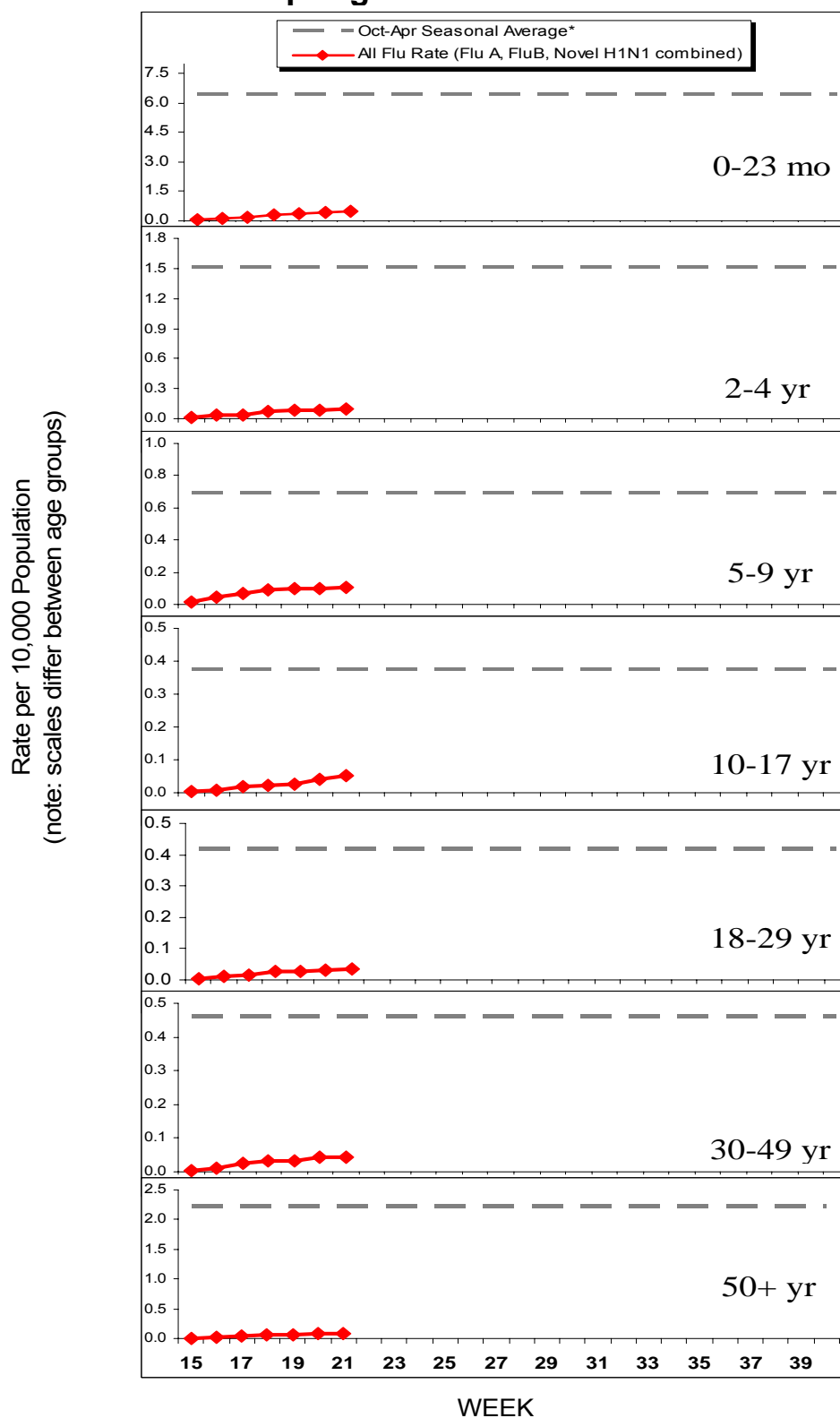
### NVSN Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children 0 - 4 Years, 2008-09 and Previous Three Seasons



During April 15, 2009 – May 30, 2009, the following preliminary laboratory-confirmed overall influenza associated hospitalization rates were reported by the EIP (*rates include type A, type B, and confirmed Novel H1N1*):

Rates for children aged 0-23 months, 2-4 years, 5-9 years, and 10-17 years were 0.5, 0.1, 0.1, and 0.1 per 10,000, respectively. Rates for adults aged 18-29 years, 30-49 years, and  $\geq 50$  years, the overall flu rates were 0.03, 0.04, and 0.1 per 10,000, respectively.

# EIP Influenza Laboratory-Confirmed Cumulative Hospitalization Rates, Spring/Summer 2009

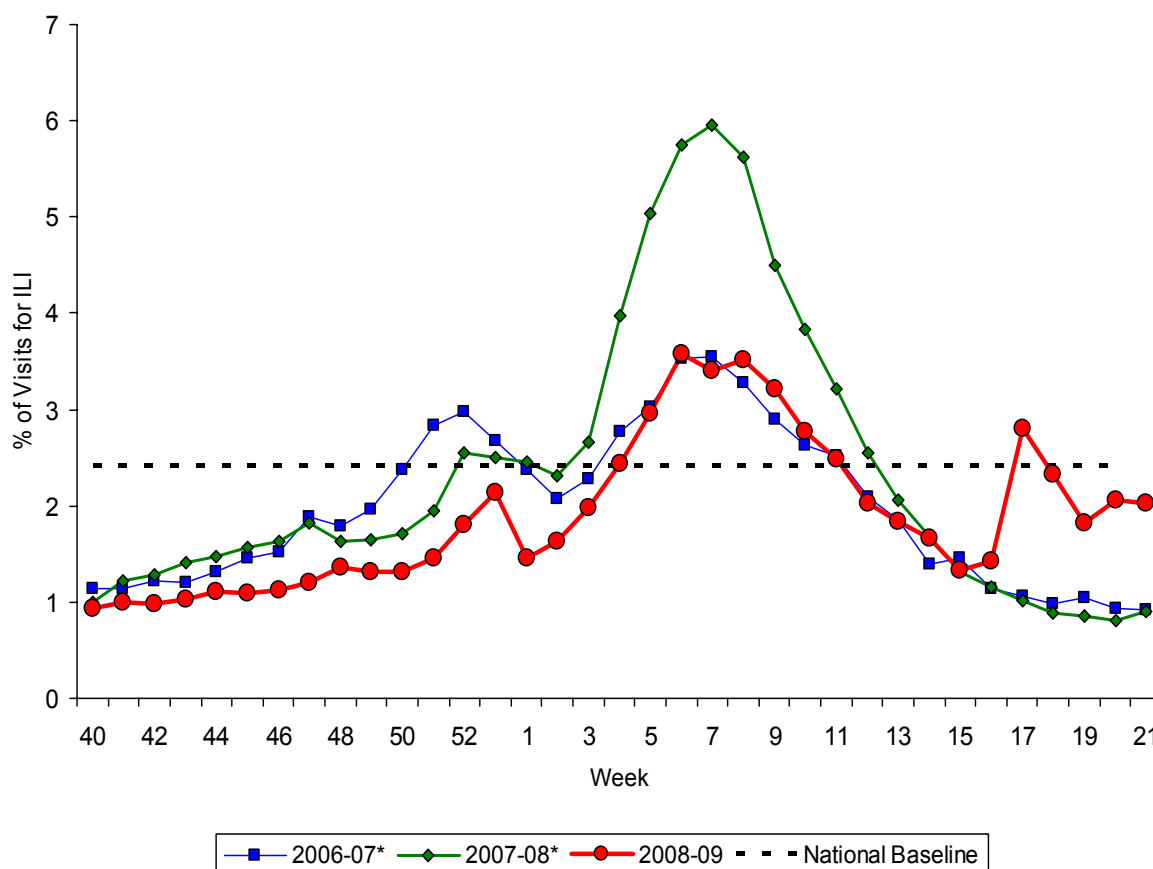


\*This value represents an age group-specific average influenza rate from October 1 to April 30 from the 2005-06, 2006-07, and 2007-08 influenza seasons.



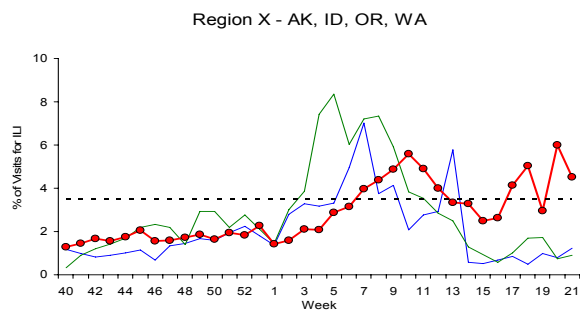
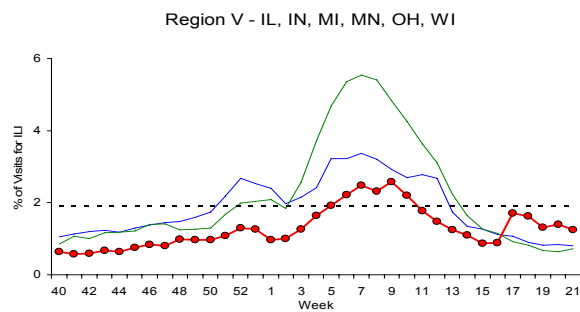
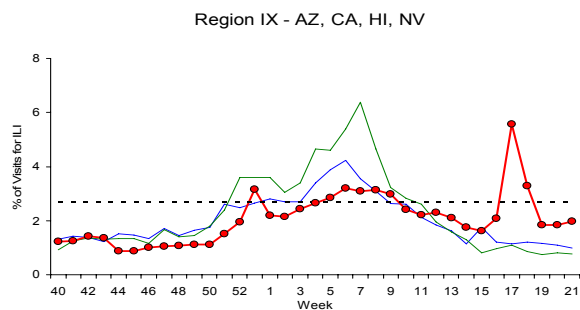
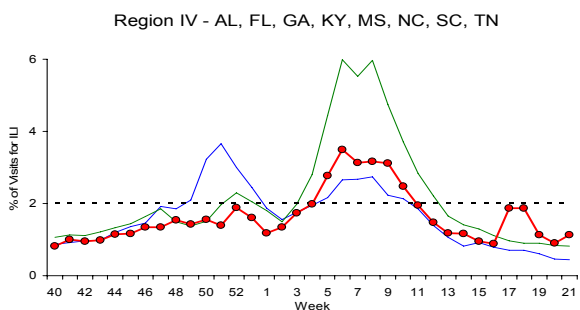
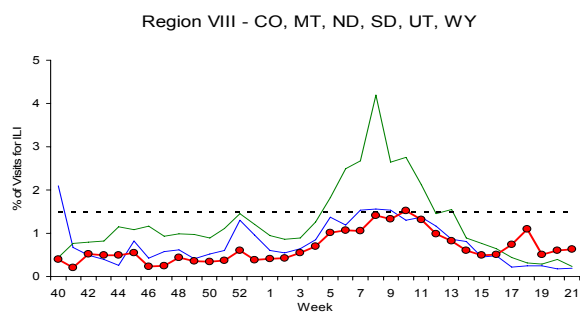
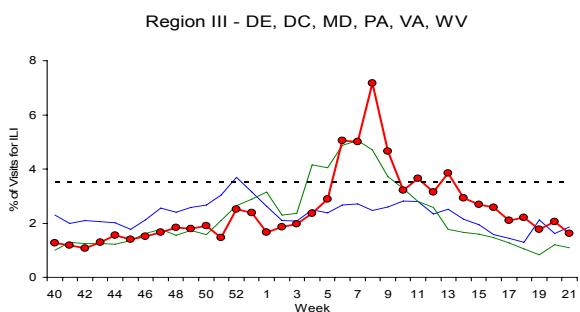
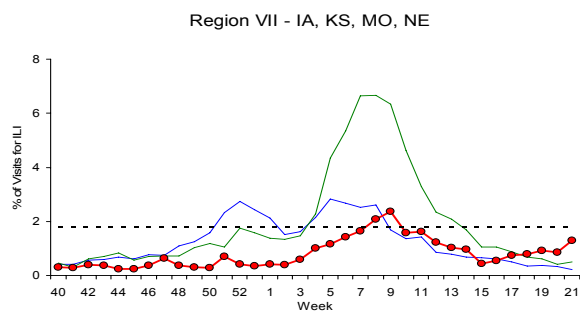
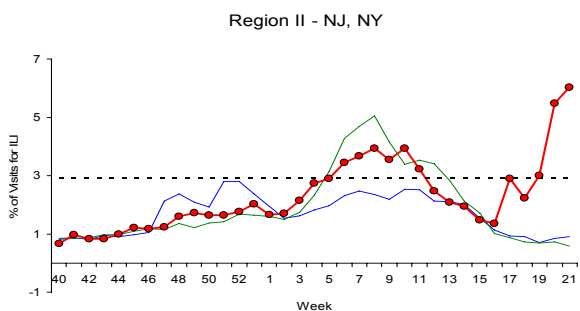
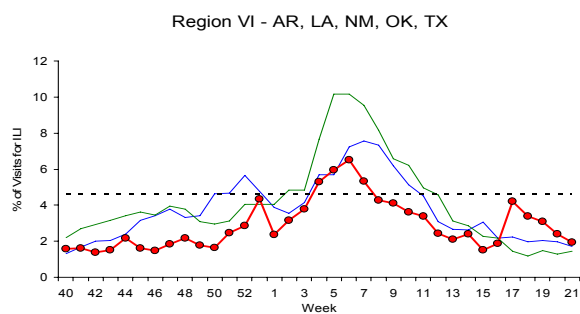
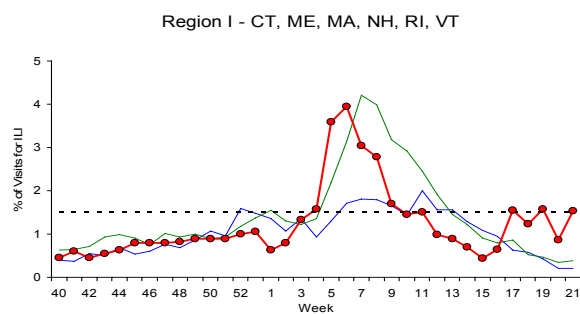
**Outpatient Illness Surveillance:** Nationwide during week 21, 2.0% of patient visits reported through the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) were due to influenza-like illness (ILI). This percentage is below the national baseline of 2.4%.

### Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), National Summary, 2008-09 and Previous Two Seasons



\*There was no week 53 during the 2006-07 and 2007-08 seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

On a regional level, the percentage of outpatient visits for ILI ranged from 0.6% to 6.0%. Three of the 10 surveillance regions reported an ILI percentage at or above their region specific baseline (Regions I, II and X). ILI increased during week 21 in six of 10 regions compared to week 20.



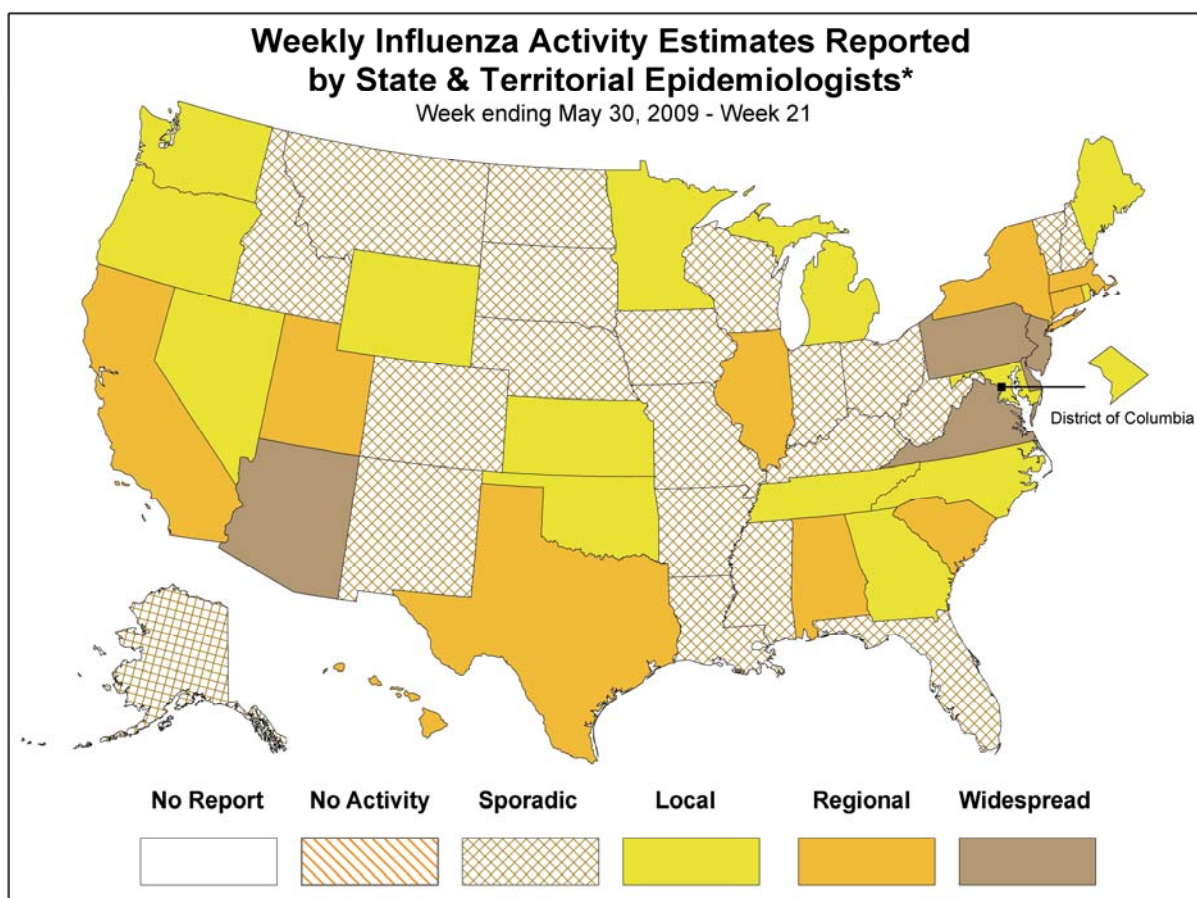
NOTE: Scales differ between regions

NOTE: There was no week 53 during the 2006-07 and 2007-08 seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

**Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists:** The influenza activity reported by state and territorial epidemiologists indicates geographic spread of both seasonal influenza and novel influenza A (H1N1) viruses and does not measure the severity of influenza activity.

During week 21, the following influenza activity was reported:

- Widespread influenza activity was reported by five states (Arizona, Delaware, New Jersey, Pennsylvania, and Virginia).
- Regional influenza activity was reported by 10 states (Alabama, California, Connecticut, Hawaii, Illinois, Massachusetts, New York, South Carolina, Texas, and Utah).
- Local influenza activity was reported by the District of Columbia and 14 states (Georgia, Kansas, Maine, Maryland, Michigan, Minnesota, Nevada, North Carolina, Oklahoma, Oregon, Rhode Island, Tennessee, Washington, and Wyoming).
- Sporadic activity was reported by 21 states (Alaska, Arkansas, Colorado, Florida, Idaho, Indiana, Iowa, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, South Dakota, Vermont, West Virginia, and Wisconsin).



\* This map indicates geographic spread & does not measure the severity of influenza activity

A description of surveillance methods is available at: <http://www.cdc.gov/flu/weekly/fluactivity.htm>

Report prepared: June 5, 2009.